

DOCUMENT RESUME

ED 257 002

CG 018 224

AUTHOR Kirby, Edward Aaron
TITLE Durable and Generalized Effects of Cognitive-Behavior Modification with Attention Deficit Disorder Children.
PUB DATE Aug 84
NOTE 42p.; Paper presented at the Annual Convention of the American Psychological Association (92nd, Toronto, Ontario, Canada, August 24-28, 1984).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Attention Deficit Disorders; *Behavior Modification; Children; *Cognitive Restructuring; Cognitive Style; Elementary Education; Generalization

ABSTRACT

Children with Attentional Deficit Disorder (ADD) are characterized by chronic inattention and impulsivity. There recently has been an increased interest in treatment regimens which attempt to alter ADD children's learning and behavioral styles by focusing on cognition and directly observable behaviors. A study was undertaken to evaluate a Cognitive-Behavior Modification (CBM) program designed to produce durable and generalized improvement in the behavior and learning styles of 6- to 12-year-olds with ADD. The children were assessed using parent and teacher ratings, educational tests, and psychological measures. The children were then randomly assigned to either a CBM treatment (N=13) or a control group (N=7), which received academic tutoring and general discussions of individual and collective problems. The post-test results immediately following treatment indicated more improvement among the CBM children. Some children (N=6) from the CBM group participated in eight booster sessions designed to promote durability and generalization of treatment gains. The results from a follow-up evaluation conducted 1 year after the initial evaluation indicated that CBM children continued to perform better than controls, and that children who had received booster sessions performed better on most measures than did non-booster CBM children. (Author/NRB)

 * Reproductions supplied by EDRS are the best that can be made *
 * from the original document. *

ED257002

Durable and Generalized Effects of Cognitive-Behavior
Modification with Attention Deficit
Disorder Children
Edward Aaron Kirby
Indiana State University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

X This document has been reproduced as
received from the person or organization
originating it.
Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official NIE
position or policy.

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Edward A. Kirby

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

Running head: DURABLE AND GENERALIZED EFFECTS

CG 018224

Abstract

This study evaluated a Cognitive-Behavior Modification (CBM) program designed to produce durable and generalized improvement in the behavior and learning styles of young Attention Deficit Disorder children (ages six to twelve). Children were assessed using a variety of measures including parent and teacher ratings, educational tests and psychological tests. Thirteen children were randomly assigned to a CBM treatment while seven children were assigned to a control group which received academic tutoring along with general discussion of their individual and collective problems. Results of the post testing immediately following treatment clearly indicated more improvement among the CBM group children. During the second phase of the study, six of the children from the CBM group were provided with eight (weekly) booster sessions designed to promote durability and generalization of treatment gains. These booster session subjects along with the remaining CBM subjects and the initial control group were re-evaluated one year after the initial evaluations to compare treatment gains. The results of these follow-up evaluations indicate that the CBM group children continued to perform better than the initial control group children. Within the CBM group, the children who received booster sessions performed better on most measures than did the non-booster subjects.

Durable and Generalized Effects of Cognitive-Behavior
Modification with Attention Deficit Disorder Children

The diagnostic term which designates children as "Attention Deficit Disorder" (ADD) replaced the more common and familiar term "hyperactive" and "hyperkinetic." The impetus for this change comes from accumulated research evidence indicating that chronic inattention and impulsivity are the major features of this childhood disorder (Douglas, 1980). Accompanying this change of terminology, there has been an increasing interest in treatment regimens which attempt to alter ADD children's learning and behavioral styles by focusing on cognition in addition to modifying underlying physiology or on directly observable behaviors (Meichenbaum & Goodman, 1971; Douglas (1972); Shure & Spivack, 1978, 1982).

The basic paradigm for cognitive and cognitive-behavioral treatment is described in studies by Palkes, Stewart, and Kahana (1968) and Meichenbaum and Goodman (1971). Later papers have reported on alterations of the basic treatment paradigm in attempts to improve effectiveness and duration of treatment (Meichenbaum, 1977; 1980). Much of the concern for improving cognitive-behavioral treatment stems specifically from the mixed but generally disappointing findings regarding treatment generalization and durability (Abikoff, 1979; Friedling & O'Leary, 1979; Meichenbaum, 1980).

A general impression one gets from reviewing studies which failed to demonstrate generalization (and even from some which were successful) is that lasting improvement was not well planned for or integrated into the treatment. The present study was designed to evaluate a cognitive-behavior modification (CBM) program explicitly designed to facilitate durable and generalized improvement in the behavior and learning styles of six to twelve year old ADD children. Phase one of this study evaluates immediate effects of treatment. Phase two evaluates the children one year later.

Procedure--Phase One

Screening

A letter was sent to 36 elementary schools in or near Terre Haute, Indiana describing the characteristics of ADD children and indicating that a summer remedial program would be available at Indiana State University. Teachers were asked to discuss his or her potential referrals with the child's parent or guardian and to have them contact the university if they concurred with the teacher that the referral seemed appropriate.

If, after extended phone conversations between the senior author and the parent or guardian, a child appeared to fit the description of ADD provided in the Diagnostic and Statistical Manual of Mental Disorders (1980), screening continued.

Hyperactivity rating scales (Conners, 1969) were mailed to the home and the school for parents and teachers to complete. If a child's

score on either of these scales was 16 or higher, the Daily Behavior Checklist (DBC) developed by Prinz, Connor, and Wilson (1981) was distributed to the teachers of the referred children who were then requested to observe and rate each child for five days. The DBC is a list of eleven hyperactive and eleven aggressive behaviors. At the end of each day the teacher circled the behaviors which occurred that day. If for the five days more aggressive behaviors were circled than were hyperactive, then the child was not accepted into the program.

Assessment

Measures described below were used to evaluate the treatment:

Wechsler Intelligence Scale for Children--Revised (WISC-R) (Wechsler, 1974). Of particular interest on this measure was the freedom from distractibility (FD) quotient. FD is based on the combined subtest scores of coding, arithmetic, and digit span (Kauffman, 1979). Verbal and Performance quotients were also analyzed.

Peabody Individual Achievement Test (PIAT) (Dunn & Markwardt, 1970). This measure provides scores in math, reading, spelling, general information, and overall total-achievement score.

Matching Familiar Figures Test (MFFT) (Kagan, 1966). This test is described by Kagan as a measure of conceptual style or tempo and yields scores on latency (the time a child hesitates before responding) and errors.

Self-Control Rating Scale (SCRS). The SCRS is a 33 item scale. Each of the 33 items are rated on a 7 point scale by parents or teachers. Ten of the items are descriptive of self-control, 13 are indicative of impulsivity, and ten items are descriptive of a combination of both self-control and impulsivity.

Continuous Performance Test (CPT). The CPT was originally developed as a measure of brain damage (Rosvold, 1965) but has been used as an experimental measure of vigilance of attention. It consists of a rewired digital clock which displays a single digit number at one second intervals. The child is instructed to keep his/her attention on the clock face and to ring a buzzer when (and only when) a zero is followed by a one. The performance is scored for inclusive errors and omissions. Impulsivity (inclusive errors)--usually means buzzing when the zero appears without waiting for the one to appear. Children who do well on this type of task appear to be able to focus attention well but are often unable to attend selectively and productively to tasks which require a high level of problem solving skill.

Children's Embedded Figures Test (CEFT) (Karp & Konstadt, 1971). The CEFT is described as a measure of cognitive style and has consistently been related to the construct of field dependence-independence.

Locus of Control Questionnaire (LC). This scale was developed for this study in order to measure the extent to which

children believe that they, rather than "fate" or "luck," can control their lives. The questionnaire consists of twenty "yes" or "no" questions--such as, "If I have a bad day there is nothing I can do to make it better." This measure is experimental and no reliability or validity estimates are yet available.

All of the above measures were administered by male and female graduate students who had completed at least one course in individual psychological assessment of children. These students were kept unaware of which children were designated for which treatment groups.

Conners Teacher and Parent Questionnaires. The teacher questionnaire contains 39 items and the parent questionnaire contains 28 items. Each item is rated on a 0 to 3 scale. Only ten of the items on each questionnaire are scored for hyperactivity.

Procedure

Subjects

Approximately seventy children were involved in the initial referral and screening process. Of these, thirty-five were scheduled for the assessment phase. Many children were eliminated from consideration for the program because the behaviors, while fitting the ADD description, were of recent origin and appeared highly situational in nature. Other reasons for rejecting children from the program included previously

diagnosed mental retardation, unwillingness by the parent or guardian to guarantee a child's regular attendance and participation in the program, serious problems in addition to ADD characteristics such as uncorrectable hearing or vision problems, or signs of severe emotional disturbance.

Of the thirty-five children selected for further evaluation, two did not appear for testing appointments. Twenty-three of the remaining thirty-three children were eventually enrolled in the treatment. The major attrition factor from the assessment was absence of evidence of serious inattention or impulsivity. Several of these unselected children would be described as poorly motivated in school situations but generally able to do well on educational tasks.

Method

Sixteen of the twenty-three children selected were randomly assigned to a CBM treatment group and seven children were assigned to a control group which received academic tutoring.¹ Two children dropped out of the CBM group and one was unavailable for post testing.

In addition to the CBM and control groups a third group consisting of seven non-referred children was evaluated using the screening and evaluation measures described above. These children were selected by the teachers of referred children in response to a request to select normally active but non-problematic children.

This group was used for descriptive comparison purposes only and is thus designated the comparison group. In the CBM group there were three girls; while the control group and comparison group subjects included only one girl each.

CBM Treatment Sessions

The CBM treatment consisted of two-hour sessions (four days a week) for seven weeks. Each daily session was divided into three periods. During the first period, self-instructional training was provided using individual and group games as the teaching format. The objective was to have the children realize that by using such self-instructional steps as (a) calming themselves down, (b) devising a reasonable strategy or plan, (c) monitoring their own behavior and (d) keeping a check on impulsive tendencies that they could improve their chances for academic and social success.

Children were trained to self-instruct using the procedure steps described by Meichenbaum (1980). These include:

1. The clinician models the solution of a task while talking to himself out loud. (cognitive modeling)
2. The child performs the same task under the direction of the model's instructions. (overt, external guidance)
3. The child performs the task while instructing himself aloud. (overt self-guidance)
4. The child whispers the instructions to himself as he goes through the task. (faded, overt, self-guidance)

5. The child performs the task while guiding his performance via inaudible or private speech. (covert, self-instruction)

The clinicians did not model self-instructions in a rote or strictly cognitive manner. Rather they were taught to be animated and responsive to the individual children. When, for example, it was noticed that a child was becoming frustrated and agitated or weary and defeated in response to a task demand, the clinicians modeled self-coping statements such as "Boy this is hard. I've tried everything I can think of. I'm just no good at this kind of thing. Wait a minute. I'm getting all worked up. I can't do good work when I'm like this. I'll just calm down a bit and start again. That's better; now what can I do to get at this?"

The second period of the daily sessions involved using the self-instructional steps on more formal academic tasks such as reading for retention, math, and learning to spell. The final period of each day was spent in group discussion and practice in the area of interpersonal skills. In order to help the ADD children deal more effectively with feelings of frustration, anger, and personal inadequacy, rap sessions or group discussions were conducted whereby the children could consider the potential value of "thinking before they act." Again, the self-instructional steps were employed as the means of improving interpersonal skills.

A number of therapist manuals were provided to the clinicians (see Appendix). The main one used was by Padawer, Zupan, and Kendall (1980). However, manuals were not used in a rote fashion. The manuals provided general treatment guidelines and gave treatment a degree of similarity across subjects. Children worked in small groups of four or five with two clinicians assigned to each group.

A response-cost procedure was used to supplement the cognitive training as described in the Padawer et al. manual. Children were given twenty tokens before each session and one of these was taken away each time a child engaged in inattentive and/or impulsive behaviors.

Staff Training

This author's experiences are in agreement with those of Bash and Camp (1980) who report that people who are not thoroughly familiar with cognitive-behavioral theory do not readily learn to successfully implement cognitive-behavioral treatment. In this study, the clinicians who worked directly with the children were ten advanced graduate students enrolled in School Psychology and Counseling Psychology Programs. Predominately doctoral candidates, these students met with the senior author for two hours a week for one full semester prior to working with the children. These preparation sessions included in-depth reading assignments, group brainstorming sessions while

viewing and critiquing videotapes of previous CBM pilot programs conducted at Indiana State, and the development of age-appropriate training materials.

Aspects of the Program Aimed Toward
Increasing Durability and Generalization

1. The selected children were told that this summer program had one main aim: to help them learn strategies and skills they could specifically use to improve their performance at home and at school. During the duration of the seven-week program, the children were frequently queried and reminded about applying their new CBM skills at home. In addition, discussions toward the end of the summer concerned anticipation of difficult situations which might arise in the school-year ahead and ways to use their newly learned CBM skills in dealing with such situations.

2. The final 30 minutes of each daily session involved combining the children into larger groups (of ten to twelve) to simulate a real classroom situation requiring standard individual seatwork assignments or group learning activities.

3. Cue cards featuring a wise tortoise advising:

- C A L M Calm yourself down.
- Always think of a plan first.
- Let your thoughts help you work.
- Make sure you reward yourself.

were adhered to each child's desk during the daily sessions. In the fall, these cards were given to the subjects' teachers for

similar individual desk-reminders to prompt the children to use their new skills and strategies back in the regular classroom.

4. During the last week of the seven-week summer program, classes were moved from the clinic setting to a local elementary school.

5. Children were given T-shirts depicting a tortoise traversing a maze. The slogan read "Succeed with Strategy." These shirts were worn one day a week during the program and parents were urged to have their children wear the shirts at regular intervals during the regular school year.

6. Prior to the beginning of the program, all the selected subjects' parents and/or guardians were invited to a meeting for general information and explanations regarding the program. Parent involvement in treatment was also amplified throughout the program by an accessible library of cognitive training materials. Finally, parents were encouraged to observe training sessions (via one-way mirrors) to witness the sessions live and/or prompted to watch videotapes of the sessions.

Control Group Sessions

The self-instructional treatment group represents a multifaceted intervention and the control group was designed to control for only certain features of the treatment, namely exposure to training material and trainer attention and involvement.

The control group sessions were also divided into three periods which involved (a) games, (b) academic tasks and (c) discussions of interpersonal and social skills. The tokens available to the CBM subjects through the response-cost procedure were also available. With the control group, however, tokens were not contingently connected to specific behaviors but were awarded based on the clinicians evaluation of each child's overall performance each day. The academic materials such as worksheets and workbooks were generally the same or quite similar in the application of self-instructional training and response cost system.

Children in the control group were also given "Succeed with Strategy" t-shirts and were taken to the local elementary school for the final week of the program. Parents of the control children were encouraged to observe and suggestions were frequently given to parents of control group children regarding discipline, homework, and such.

Results

Table 1 summarizes the means, standard deviations, and F-ratios comparing the three groups employed in the study. The table shows that the comparison group (non-referred children) differed significantly from one or both of the treatment groups on the CPRS, SCRC, CEF1, CPT (exteraneous errors), and LC. The comparison group did not differ significantly on the MMFT, PIAT (total score), FD, or CPT (omissions). The results of the Duncan

Multiple Range Test also reported in Table 1 shows that the CBM group and the Control group did not differ significantly on any of the twelve measures.

Insert Table 1 about here

In order to evaluate the overall effects of treatment, the gain score of the CBM and Control groups were compared using a multivariate analysis of variance procedure or MANOVA (Cooley & Lohnes, 1962). All measures used in the study were included in this analysis with the exception of the parent ratings which were excluded due to missing data. These measures were analyzed separately. The F ratio resulting from the MANOVA was 7.36 which with 15 and 4 degrees of freedom is significant at the .05 level of confidence.

Insert Table 2 about here

Univariate F tests were computed in order to determine the individual contribution of each of the variables entered in the MANOVA. These results summarized in Table 2 indicate that the CPT (omissions and extraneous errors), MFFT latency, LC, and the PIAT (math and reading comprehension) were the major contributors.

Analyses of the parent ratings indicate that the two groups differed significantly on the SCRS $F = 9.48$, $p < .01$, but not on the CPRS, $F = 1.75$, $p < .56$. In terms of the direction of change, the CBM group showed improvement on all measures included in the study with the exception of PIAT reading recognition and spelling subtests. The control group showed improvement on the CPRS, SCRS, CEFT, MFFT, and the PIAT General Information subtest. Tables 3 and 4 show the direction and magnitude of change for the two groups.

Insert Tables 3 and 4 about here

The early and continuing hypothesis of the proponents of CBM is that such an approach addresses the central difficulty of ADD children which is their pervasive tendency to avoid developing and/or using cognitive mediation skills in a broad range of academic and social situations where such skills could greatly improve their adjustment. The findings that CBM does effect performance in a fairly broad range of academic and social areas offers additional support to this hypothesis. Although the findings of phase one of the present study are encouraging, the acid test for the contention that CBM can effect fundamental improvement in ADD children is the degree to which such improvements continue over time and occur in a variety of academic and social settings.

The second phase of this study involved a one year follow-up evaluation seeking to facilitate generalization and some long term effectiveness of CBM training with ADD children.

Phase Two

Subjects

The second phase of this study involved booster sessions for one half of the CBM subjects and a one year follow-up evaluation seeking to assess generalization and long term effectiveness of CBM with ADD children. Of the thirteen subjects who participated in the CBM group, six were randomly assigned to a booster-session group and the remaining seven were assigned to a no-booster session control group. One of the booster session subjects moved out of the district at mid-year leaving five booster and seven no-booster subjects.

Procedure

Midway through the school year, immediately following phase one of the treatment, children in the booster-session group were visited in their school by a clinician from the summer CBM treatment program once each week (for eight weeks). The booster sessions consisted of review of self-instructional skills learned earlier and exploring problem areas and situations where these skills could and should be applied. The clinicians also met with the children's regular teachers and explained the type of treatment which had been provided. Each child was asked to keep

a "self-monitoring" checklist taped to his or her desk which listed behaviors such as

- Did I focus in and understand the directions?
- Am I staying calm and keeping my mind on my work?
- Am I using a good strategy here?
- Am I getting anywhere, or am I stuck?

Children in the booster sessions were also given homework assignments which involved noticing and reporting each week the times when they used CBM related skills in settings other than school.

Immediately following the eight weeks of booster sessions all subjects were re-evaluated using an abbreviated battery of the measures used initially. Six of the subjects used as controls for the initial phase of the study were also re-evaluated at this time. This testing occurred approximately one year after the treatment began.

Results

The MANOVA procedure used to evaluate the effects of treatment in phase one of the study was also employed to evaluate the long term treatment effects. With the CBM booster and no-booster groups combined and compared with the control group, the F ratio failed to reach significance at the .05 level ($F = 2.93$, $p < .16$). The variables entered into the MANOVA were those listed in Table 5. Univariate F tests comparing the CBM booster, CBM no

booster and the control groups indicated that only one measure was significant. This measure was the teacher ratings of hyperactivity ($F = 4.22, p < .03$). The Duncan multiple range test indicated that both the booster and the no booster groups were significantly more improved than the control group ($p < .05$) on the teacher hyperactivity ratings. Teacher ratings on the SCRS came close to differentiating between the groups ($F = 3.56, p < .06$).

Insert Table 5 about here.

Table 5 presents means, standard deviations and t values for the pre-treatment and follow-up data for the combined CBM booster and no-booster groups compared with the control group. The CBM group was found to improve significantly on six of the eight measures, while the control group showed a significant change on only one measure. This was the NEFT where the latency scores were found to decrease.

MANOVAs comparing the gain scores of the CBM booster and no-booster groups indicated no significant differences between these two groups. Individual t tests of gain scores within each of these two groups showed that the CBM booster group improved significantly on the CTRS ($p < .05$); the CPRS ($p < .05$) and the SCRS mothers' ratings ($p < .05$). The no booster group improved significantly on the CRTS ($p < .008$), and on the FD measure ($p < .003$).

Discussion

Overall the results of the present study are consistent with other investigations of the potential clinical value of CBM in altering the behavior of ADD children (Bugental, Collins & Chaney, 1978; Douglas, Parry, Marton & Garson, 1976; Hinshaw, Henker, & Whalen, 1984; Konstantareas & Hermitidis, 1983). Although the number of children in each group was small, the results support the contention that CBM training can produce durable and generalized changes in ADD children. While booster sessions did not appear to have much effect on the children, it is encouraging that even without such sessions gains are maintained over a one year period and are evident on a variety of measures.

The author is optimistic about the potential value of CBM with ADD children but is humbled by several facts. The basic theoretical model for cognitive treatment is deceptively straightforward and simple. Training children to alter longstanding and pervasive tendencies to avoid reflective self-guidance requires much more than the structural trappings of CBM. Teaching children to think is much more difficult than training them to talk about thinking. Moreover, even with a fairly large number of treatment hours intensively aimed toward behavior change; the overall changes, while encouraging, remain relatively small.

Several years ago Karoly (1977) reviewed the literature concerned with developing self-control in children and concluded that such training has:

1. been conducted mainly in laboratory settings,
2. employed nonclinical populations,
3. neglected individual differences and cognitive-developmental variables,
4. failed to apply systematic pretreatment assessment,
5. operated under the assumption of a general skills deficiency (as opposed to possible perceptual, decisional, or motivational deficiencies),
6. attempted to demonstrate the efficacy of a singular (or limited) intervention strategy,
7. focused on a narrow range of self-control responses (where the frequent use of quotation marks around terms like hyperactive, impulsive, overactive, distractable, learning disabled, delinquent, excitable, aggressive, and disruptive has served to absolve investigators of the responsibility for delineating topographic boundaries and for blasting the patient homogeneity myth) and,
8. failed to pay sufficient attention to issues of maintenance and transfer.

While not all of Karoly's criticisms have been met, several of these shortcomings have been addressed by the present study. In attempting to bridge the gap between the precise but rather narrow finding of laboratory studies and the messier but more relevant application of self-management training with a clinical population such as ADD children, future researchers have their work cut out for them.

References

- Abikoff, H. (1979). Cognitive training interventions in children: Review of a new approach. Journal of Learning Disabilities, 12, 65-77.
- Bash, M. A., & Camp, B. W. (1980). Teaching social skills to children: Innovative approaches. Gwendolyn Cartledge and Joanne Fellows Milburn (Eds.). New Jersey: Pergamon Press.
- Bugental, D. B., Collins, S., Collins, L., & Chaney. (1978). Attributional and behavioral changes following two behavior management interventions with hyperactive boys: A follow-up study. Child Development, 49, 247-250.
- Cairns, E., & Cammock, T. (1978). Development of a more reliable version of the Matching Familiar Figures Test. Developmental Psychology, Vol. 14, No. 5, 555-560.
- Conners, E. K. (1969). A teacher rating scale for use in drug studies with children. American Journal of Psychiatry, 126, 885-888.
- Cooley, & Lohmeier (1974). Cited in S. Huck, W. Cormier, and W. Bounds, Reading statistics and research. New York: Harper and Row.
- Diagnostic and statistical manual of mental disorders (3rd ed.). (1980). Washington, DC: American Psychiatric Association.

- Douglas, V. (1972). Stop, look and listen: The problem of sustained attention and impulse control in hyperactive and normal children. Journal of Behavioral Science, 4(4).
- Douglas, V. I. (1980). Treatment and training approaches to hyperactivity: Establishing internal control. In C. K. Whalen and B. Henker (Eds.), Hyperactive Children--The Social Psychology of Identification and Treatment. New York: Academic Press.
- Douglas, V. I., Parry, P., Marton, & Garson, C. (1976). Assessment of a cognitive training program for hyperactive children. Journal of Abnormal Child Psychology, 4(4), 389-410.
- Dunn, L. M., & Markwardt, F. C. (1970). Peabody Individual Achievement Test. Circle Pines, MN: American Guidance Service, Inc.
- Friedling, C., & O'Leary, S. (1979). Effects of self instructional training on second and third-grade hyperactive children: A failure to replicate. Journal of Applied Behavior Analysis, 12, 211-219.
- Hinshaw, S. P., Henker, B., & Whalen, C. (1984). Self-control in hyperactive boys in anger inducing situations: Effects of cognitive-behavioral and of methylphenidate. Journal of Abnormal Child Psychology, 12(1), 55-77.

- Kagan, J. (1966). Reflection-impulsivity: The generality and dynamics of conceptual tempo. Journal of Abnormal Psychology, Vol. 71, No. 1, 17-24.
- Karoly, P. (1977). Behavioral self-management in children: Concepts, methods, issues, and directions. In M. Hersen, R. Eisler, and P. Miller (Eds.), Progress in Behavior Modification, Vol. 5. New York: Academic Press.
- Karp, S. A., & Konstady, N. (1971). Childrens' Embedded Figures Test. Palo Alto, CA: Consulting Psychologists Press.
- Kaufman, A. S. (1979). Intelligent testing with the WISC-R. New York: John Wiley & Sons.
- Kendall, P. (1977). On the efficacious use of verbal self-instructional procedures with children. Cognitive Therapy and Research, 1, 331-341.
- Kendall, P. C., & Wilcox, L. E. (1979). Self-control in children: Development of a rating scale. Journal of Consulting and Clinical Psychology, 47, 1020-1030.
- Konstantareas, M. M., & Hermatidis, S. (1983). Effectiveness of cognitive mediation and behavior modification with hospitalized hyperactives. Canadian Journal of Psychiatry, 28, 462-470.
- Meichenbaum, D. (1977). Cognitive behavior modification: An integrative approach. New York: Plenum Press.
- Meichenbaum, D. (1980). Teaching thinking: A cognitive-behavioral perspective. Paper presented at the NIE-LRDC Conference on Thinking and Learning Skills, Pittsburgh.

- Meichenbaum, D., & Goodman, J. (1971). Training impulsive children to talk to themselves. A means of developing self control. Journal of Abnormal Psychology, Vol. 77, 2, 15-126.
- Palkes, H., Steward, M., & Kahana, B. (1968). Porteus maze performance after training in self-directed verbal commands. Child Development, 39, 817-826.
- Prinz, R. J., Connor, P., & Wilson, C. (1981). Hyperactivity and aggressive behaviors in childhood: Intertwined dimensions. Journal of Abnormal Child Psychology, 2, 191-202.
- Rosvold, H. A. (1965). A continuous performance test of brain damage. Journal of Consulting Psychology, 20, 343-350.
- Shure, M., & Spivack, G. (1978). Problem-solving technique in childrearing. San Francisco: Jossey Bass.
- Shure, M., & Spivack, G. (1982). Interpersonal problem-solving in young children: A cognitive approach to prevention. American Journal of Community Psychology, Vol. 10, 3.
- Wechsler, D. W. (1974). Manual for the Wechsler Intelligence Scale for Children--Revised. New York: The Psychological Corporation.

BEST COPY AVAILABLE

Table 1

Means, Standard Deviations and F Ratios Comparing the Three Groups Prior to Treatment

Variables	1 CBM Group			2 Control Group			3 Comparison Group			F- ratio	P <	Source*
	N	X	S.D.	N	X	S.D.	N	X	S.D.			
Conner's Parent Rating Scale --hyperactivity (CTRS)	11	19.6	5.3	6	19.5	3.0	7	3.4	4.1	27.4	.001	1 & 2 2 & 3
Self-Control Rating Scale Parent-Ratings (SCRS)	10	170.9	22.7	7	175.7	20.1	7	83.8	13.9	36.8	.001	1 & 2 2 & 3
Matching Familiar Figures Test --Latency (MFFT)	13	14.7	12.7	7	12.9	9.0	7	13.3	7.1	.27	N.S.	
Matching Familiar Figures Test --Errors (MFFT)	13	20.9	8.2	7	25.9	12.9	7	10.4	8.4	.95	N.S.	
Peabody Individual Achievement Test--Total Score (PIAT)	13	96.2	14.5	7	102.3	6.9	7	110.4	7.4	1.74	N.S.	
Freedom from Distractability (FD)	13	87.6	15.0	7	89.6	11.7	7	98.2	9.1	1.17	N.S.	
Children's Embedded Figures Test Raw Score (CEFT)	13	11.8	5.0	7	14	6.4	7	22.5	.6	3.38	.05	1 & 3
Continuous Performance Test --Omissions (CPT)	12	1.2	2.2	7	.9	1.2	7	.25	.5	.90	N.S.	

Durable and Generalized

27

BEST COPY AVAILABLE

Table 1 (continued)

Variables	1 CBM Group			2 Control Group			3 Comparison Group			F- Ratio	P<	Source*
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.			
Continuous Performance Test Extraneous Errors (CPT)	12	11.6	13.5	7	11.0	9.9	7	1.0	1.2	6.04	.008	1 & 3 2 & 3
External Locus of Control (LC)	12	8.3	1.4	7	5.9	3.3	7	4.8	.8	6.7	.005	1 & 2 2 & 3
Conner's Teacher Rating Scale--hyperactivity (CTRS)	12	20.2	4.1	6	20.7	4.4	No data available for comparison group					
Self-Control Rating Scale --Teacher Ratings (SCRS)	10	166.9	21.6	5	171.6	10.6	No data available for comparison group					

*Multiple Range Test Duncan procedure for the .050 level.

Variable and Generalized

28

Table 2

Univariate F Tests of Gain Scores Immediately Following Treatment
(D.F. = 1,18)

	F	Sig. of F
Childrens Embedded Figures Test (CEFT)	.80	.536
Continuous Performance Test (CPT)		
Omissions	4.16	.056
Exteraneous Errors	6.94	.017
Matching Familiar Figures Test (MFFT)		
Latency	.25	.626
Errors	1.00	.33
External Locus of Control (LC)	6.14	.023
Peabody Individual Achievement Test (PIAT)		
Math	14.77	.001
Reading Recognition	.39	.538
Spelling	.00	.991
General Information	.07	.793
Total Score	1.24	.829
Verbal IQ	.13	.72
Performance IQ	2.30	.146
Full Scale IQ	.95	.342

BEST COPY AVAILABLE

Table 3

Changes in Pre and Post Test Scores for the CBM Group

Measure	Pre Test Mean	S.D.	Post Test Mean	S.D.	Difference Mean	t-value	p-value <	N
Conners Parent Rating Scale--hyperactivity (CPRS)	19.6	5.3	14.1	5.7	5.5	2.6	.025	11
Self-Control Rating Scale--parent ratings (SCRS)	170.9	22.7	136.9	15.7	34	4.2	.002	10
Children's Embedded Figures Test (CEFT)	11.8	5.0	13.8	4.2	2.1	2.01	.068	13
Omission Errors--Continuous Performance Test (CPT)	1.2	2.2	.69	1.4	.53	1.02	.33	13
Extraneous Errors--Continuous Performance Test (CPT)	11.5	10.5	4.5	9.0	7	3.17	.008	13
Latency-Matching Familiar Figures Test (MFFT)	14.7	12.7	18.5	10.4	3.8	-.93	.37	13
Errors--Matching Familiar Figures Test (MFFT)	20.9	8.2	14.0	8.1	6.9	5.0	.001	13
Locus of Control External (LC)	8.3	1.4	7.0	1.9	1.3	1.9	.080	13
Peabody Individual Achievement Test (PIAT)	97.8	11.7	102.6	15.3	4.8	-2.4	.031	13
Reading Recognition	96.2	13.6	94.5	15.3	.7	.45	.660	13
Reading Comprehension	97.5	14.7	101.0	13.1	3.5	-1.5	.153	13
Spelling	89.8	14.1	89.2	12.2	.6	.3	.810	13
General Information	99.7	16.1	101.3	13.7	1.6	-.9	.392	13
Total	96.2	14.5	97.2	14.1	1.0	-.30	.405	13

Durable and Generalized

BEST COPY AVAILABLE

Table 3 (continued)

Measure	Pre Test Mean	S.D.	Post Test Mean	S.D.	Difference Mean	t-value	p-value <	N
Wechsler Intelligence Scale for Children (WISC-R)								
Verbal IQ	101.6	20.6	102.6	17.6	1.0	-.30	.769	13
Performance IQ	100.4	9.1	110.7	14.0	10.3	-4.06	.002	13
Full Scale IQ	101.5	15.6	106.8	16.5	5.4	-2.45	.030	13
Freedom From Distractability Quotient (FD)	87.6	15.0	91.4	15.4	3.7	-1.31	.215	13

BEST COPY

Table 4

Changes in Pre and Post Test Scores for the Control Group

Measure	Pre Test Mean	S.D.	Post Test Mean	S.D.	Difference Mean	t-value	p-value <	N
Conner's Parent Rating Scale--hyperactivity (CPRS)	19.5	3.0	16.7	4.9	2.8	1.3	.239	6
Self-Control Rating Scale--Parent Ratings	179.7	20.1	158.0	20.9	21.7	6.9	.001	7
Children's Embedded Figures Test (CEFT)	14.0	6.4	15.0	6.0	1.0	-.8	.474	7
Omission Errors--Continuous Performance Test (CPT)	.9	1.2	4.9	7.3	4.0	-1.4	.222	7
Extreuous Errors--Continuous Performance Test (CPT)	1.0	1.7	4.9	9.9	3.9	-1.0	.358	7
Latency--Matching Familiar Figures Test (MFFT)	12.9	9.0	13.8	6.3	1.0	-.6	.555	7
Errors--Matching Familiar Figures Test (MFFT)	25.9	12.9	23.0	12.2	2.9	.6	.590	7
External Locus of Control (LC)	5.9	3.3	7.7	3.4	1.9	-1.5	.174	7
Peabody Individual Achievement Test (PIAT)								
Math	105.4	8.5	98.0	11.0	7.4	3.3	.017	7
Reading Recognition	106.0	6.6	103.9	5.1	2.1	1.7	.150	7
Reading Comprehension	107.1	9.7	100.0	10.2	7.1	1.8	.129	7
Spelling	97.6	7.6	97.0	7.9	.6	.3	.810	7
General Information	98.4	9.5	101.0	9.4	2.6	-.7	.501	7
Total	102.3	6.9	99.6	8.0	2.7	2.0	.093	7

Durable and Generalized

32

Table 4 (continued)

Measure	Pre Test Mean	S.D.	Post Test Mean	S.D.	Difference Mean	t-value	p-value <	N
Wechsler Intelligence Scale for Children (WISC-R)								
Verbal	104.2	11.4	102.3	11.2	1.8	.5	.638	6
Performance IQ	106.0	10.7	105.8	7.5	.2	.03	.977	6
Full Scale IQ	105.0	9.6	104.2	4.4	.8	.18	.863	6
Freedom From Distractability Quotient (FD)	89.6	11.7	87.0	13.2	2.6	.40	.701	7

Table 5

Correlated t-Tests Comparing the CBM and Control Groups Pre-Treatment and One Year Follow Up Test Means

	CBM Group							Control Group						
	N	Pre-Test Mean	S.D.	Follow Up Mean	S.D.	t-value	p-value	N	Pre-Test Mean	S.D.	Follow Up Mean	S.D.	t-value	p-value <
Conner's Teacher Rating Scale (CTRS) (hyperactivity)	12	20.2	4.1	14.7	4.1	4.95	.001	6	20.7	4.4	20.7	4.7	0	1
Self-Control Rating Scale--Teacher Ratings (SCRS)	10	165.9	21.6	144.6	17.2	2.67	.025	5	171.8	10.6	186.2	13.3	-1.67	.10
Conner's Parent Rating Scale--(hyperactivity) (CPRS)	12	20.0	5.4	14.6	5.8	2.69	.025	6	19.0	3.0	17.5	4.0	.96	.20
Self-Control Rating Scale--Parent Ratings (SCRS)	12	168.6	22.6	165.3	25.8	2.13	.050	6	173.2	11.2	162.7	23.7	1.17	.15
Matching Familiar Figures Test (MFFT) --Latency	12	12.5	6.7	11.3	6.0	.51	.35	6	13.4	9.8	7.4	5.0	2.5	.05

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Table 5 (continued)

	CBM Group							Control Group						
	N	Pre-Test Mean	S.D.	Follow Up Mean	S.D.	t-value	p-value	N	Pre-Test Mean	S.D.	Follow Up Mean	S.D.	t-value	p-value <
Matching Familiar Figures Test (MFFT) --Errors	12	19.0	9.9	17.6	12.9	.50	.35	6	28.0	12.7	20.8	10.9	1.69	.10
Penbody Individual Achievement Test (PIAT)	10	96.8	14.3	101.7	17.3	-1.95	.05	6	103.3	6.9	103.3	9.8	0	1
Freedom From Distractability (FD)	11	90.8	15.0	102.4	16.1	-3.95	.005	6	89.7	12.8	97.8	8.5	-1.35	.15

Footnotes

¹Following the seven week treatment program, all control subjects were invited to participate in an after-school program offered in connection with the Indiana State University School Psychology Training Program. All control subjects were also invited to participate in the CBM treatment program to be offered the following summer.

²Clinician/"Coaches" also wore the T-shirts on designated days and identification, camaraderie and pride in being part of the program grew (visibly, though unmeasured).

Appendix

Developing Self-Control in Children: A Manual of Cognitive-Behavior Strategies by Phillip Kendal et al., University of Minnesota (unpublished).

Think Aloud-Increasing Social and Cognitive Skills--A Problem-Solving Program for Children by Bonnie W. Camp and Mary Ann S. Bash (Research Press). Champaign, Illinois, 1981.

Social Problem Solving Curriculum for Enhancing Critical Thinking Skills. Middle Elementary Level by Elias and Clarey (unpublished). Rutgers University, 1981.

Star Training Program: Self-Control Training Program by Henshaw, Alkers, Whalen, and Henker (unpublished). UCLA, 1980.

Understanding and Helping Hyperactive Children: A Manual for Parents and Teachers by Edward A. Kirby (unpublished). Indiana State University, 1980.